LIBRARY
STATE PLANT BOARD

UNITED STATES
DEPARTMENT OF AGRICULTURE

P. 27 White-fringed Beetle

BUREAU OF
ENTOMOLOGY AND PLANT QUARANTINE
NEWS LETTER

VOLUME VI

No. 6

Digitized by the Internet Archive
in 2013

http://archive.org/details/newsletter39no6

UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

NEWS LETTER

FOR APRIL 1939

Vol. VI, No. 6 (Not for publication) June 1, 1939

ADMINISTRATION

W. W. Wood

Warren Wilbur Wood, of the Division of Foreign Plant Quarantines, died in a sanatorium at Valmore, N. Mex., on April 21, 1939, following an illness of approximately 5 months. Interment took place at Lawton, Mich., on April 25. Mr. Wood is survived by his wife, Irma Moore Wood, a 16-year-old daughter, and a 2-year-old son. Mr. Wood was born in Michigan on July 16, 1896. He received his B. S. degree from the Michigan Agricultural College in 1918. He was appointed as a junior plant quarantine inspector with the Federal Horticultural Board on May 18, 1925, and was stationed at the port of New York. Later he was transferred from New York and placed in charge of the foreign plant-quarantine enforcement at Detroit and Port Huron, Mich. Subsequently his district was extended to include all ports on the Canadian border from the Atlantic coast to the eastern border of Montana. On June 23, 1938, by transfer he succeeded A. G. Webb in charge of the supervision of the enforcement of foreign plant quarantines for the district including the States of Washington, Oregon, Idaho, and Montana, with headquarters at Seattle. Mr. Wood leaves a record of efficiency and the Bureau sustains the loss of one of its most proficient and outstanding men in the field of foreign plant quarantines.

A newly discovered introduced pest.--On April 11 L. P. Wehrle, of the University of Arizona Experiment Station, found specimens of an insect which closely resembles the alfalfa weevil feeding on fenugreek (*Trigonella Foenum graecum*) near Yuma, Ariz. The insect has been determined as *Hypera brunneipennis* (Boh.). This is the first time it has been recorded as occurring in this country and little is known about the insect itself or its distribution. According to the few available published records, it has been reported as occurring in Egypt, Ethiopia, and India. As soon as it was identified, arrangements were made to have a preliminary investigation made by Bureau specialists, in cooperation with representatives of the University of Arizona and the Arizona State Department of Agriculture and Horticulture. So far as yet determined, the infestation extends southward in a narrow strip for about 8 miles from Yuma. Infestation has also been found across the river from Yuma in the vicinity of Winterhaven, Imperial County, Calif. Preliminary reports indicate that this insect feeds on sour clover (*Melilotus indica*), hubam clover (*Melilotus alba*), and fenugreek (*Trigonella Foenum graecum*), as well as on alfalfa; that at this time the adults are newly emerged and are staying close to the ground; also that, since the alfalfa hay in that area has recently been cut, scouting on an intensive scale to determine the limits of distribution appears to be impracticable until the next brood has sufficiently developed so that the larval stages of the insect may be found more readily by sweeping. A representative of this Bureau is being detailed there to keep this infestation under observation and to collect as many data as possible that may have a bearing on future plans with reference to it, as well as with respect to plans for intensive scouting.

A 4-H Club Insect Manual

The Extension Service has just issued a 4-H Club Insect Manual as Miscellaneous Publication 318 of the Department. This paper was prepared by M. P. Jones, extension entomologist, of the Division of Cooperative Extension Work. A copy of this publication was sent to each of the field stations of this Bureau. Officials will probably receive requests for this publication. We wish to call attention to the fact that this is not a publication of our Bureau and is being distributed by the Extension Service. Requests for this publication may be referred to the State Director of Extension in the State from which the request comes.

Suggestions on Preparation of Manuscripts

The Editorial Office has frequently been asked by authors for some written suggestions to guide them in the preparation of manuscripts. To be most useful such a guide should answer definite questions asked by authors or discuss matters that the editors have found to be most troublesome. Instead of waiting until such a pamphlet can be compiled, which even then would be incomplete, the Editorial Office will publish in the News Letter from time to time short memoranda covering single points or subjects which in the course of editing have been found to need explanation and concerning which information is not to be found in the Government Printing Office Style Manual. Attention to such points by authors should expedite the work in the Editorial Office and result in improved papers which are more truly the authors' own in manner of expression as well as in subject matter. For ease of reference, these editorial memoranda will be given numbers. The Editorial Office will be glad to answer any questions about manuscript preparation, either directly, or, if the question is of general interest, through these memoranda.

EDITORIAL OFFICE

Memorandum No. 1. The Summary

There appears to be some uncertainty as to what belongs in a summary. Some authors summarize only the results of their work, and others place their conclusions under this heading. Some summaries are too brief and general to give a definite idea of the contents of the paper, whereas others are too long either because of unimportant details or from lack of conciseness.

A summary is properly a summing up, or recapitulation, of the preceding discourse. It should be a concise statement of the important points in the entire paper, including the procedure or method employed and the type of data used, as well as the results and conclusion. It should give sufficient detail to inform the reader as to what new information is presented, so that he may decide whether the paper is of sufficient interest for him to read in full. The summary is all that those interested in the paper in only a general way will read, for the research worker must limit his study more or less to his own field. A good summary is also of service to abstractors.

The conclusion has an entirely different function from that of the summary. It constitutes the author's interpretation of his results, and is properly a part of the body of the paper, which should be summed up with the other parts in the summary. Sometimes the nature of the investigation is such that a discussion of results is more suitable than a statement of conclusions.

The summary should contain no material that is not presented in the text, and all statements should be in definite agreement with those in the text.

The length of a summary should be in proportion to the length of the article. For most papers about 3 percent is a proper proportion.

FRUIT INSECT INVESTIGATIONS

Methods for emulsification of dichloroethyl ether.--Two methods for the emulsification of dichloroethyl ether, in connection with studies for the control of the plum curculio attacking peaches, are reported by Oliver I. Snapp, of the Fort Valley, Ga., laboratory. One method consists of stirring nine parts by volume of dichloroethyl ether into one part by volume of potash fish-oil soap, containing approximately 30 percent of soap without an excess of potash, and then adding eight parts by volume of water for a 50-percent emulsion of dichloroethyl ether. The other method consists of adding eight volumes of water to one volume of the same grade of potash fish-oil soap, after which nine volumes of dichloroethyl ether are added and the constituents emulsified cold by pumping.

Winter survival and early spring activity of Japanese beetle.--The following summary of the winter survival and early spring activity of the Japanese beetle has been prepared by the staff of the Japanese beetle laboratory at Moorestown, N. J. The unusually late development observed among Japanese beetle larvae early in the fall of 1938 was largely overcome by the subsequent mild fall weather, although it appears that a somewhat higher than normal proportion of second-instar larvae entered hibernation. This condition persisted throughout the winter months when soil temperatures were below the threshold of development. During the winter months snow cover was generally sufficient throughout periods of severe weather to provide effective insulation, so that at the levels occupied by overwintering larvae soil temperatures (based on records made at Moorestown) presumably never fell more than 1° below freezing. Insofar, then, as can be determined, winter mortality was no higher than would be normally expected. At the close of April second-instar larvae, in general, constituted a higher proportion of the soil population than is normal for this time of the year. Considerable variation existed, however, in the proportion of second-instar larvae in different sections of the area generally infested, ranging from 6 percent near Reading, Pa., to 33 percent in Westchester County, N. Y. In the immediate Philadelphia area roughly 15 percent of the current brood were second instars at the beginning of the month. Taking as the normal the average for the 11-year period 1926-36, inclusive, approximately 6+ percent of the soil population would be in the second larval instar.

MEXICAN FRUITFLY CONTROL

Fruitfly data from lower Rio Grande Valley.--Sterilization was required on all grapefruit harvested for shipment from the lower Rio Grande Valley after April 11. This action was necessary because of the steady increase in the degree of infestation, as well as the number of infestations being found in valley groves. In view of the fact that fruit sterilization proved such a success, it was possible to extend the harvesting season for grapefruit from April 30 to May 15. The harvesting season for Valencia oranges previously had been extended to June 15. Larval infestations were found on 704 properties within the regulated area and on 2 citrus plantings outside of the area. These last 2 infestations were found in Dimmit and LaSalle Counties. Trap records indicate that emergence of flies from infested groves began at a rapid rate during the latter half of April. In February 2,150 flies were trapped in valley groves, whereas in March only 588 flies were taken. The catch for April, however, increased to 1,931 flies and most of these were newly emerged. Fruit shipments for April totaled 2,656.6 equivalent carloads, bringing the total movement for the season to 28,266.7. This exceeds the movement for last season for the same period by 8,279.8 carloads.

CEREAL AND FORAGE INSECT INVESTIGATIONS

Laboratory infection of wireworms by Metarrhizium.--L. P. Rockwood, Forest Grove, Oreg., reports that infection experiments, under laboratory conditions, using cultures of 2 forms of entomogenous fungi of the genus *Metarrhizium* on larvae of the elaterid *Limonius californicus* (Mann.), furnished by F. H. Shirck, of the Division of Truck Crop and Garden Insect Investigations, were carried on with the wireworms isolated in 5-ounce salve boxes and also with aggregations of 25-30 wireworms placed in 1-pound coffee cans. Sterilized sandy loam was used in the cans, with wheat kernels as food for the worms. The fungi used were a green-spored form, probably typical *Metarrhizium anisopliae* (Metsch.), that was cultured from an *L. californicus* larva from Parma, Idaho, in 1937, and a brown-spored form cultured from wireworms collected near Forest Grove in 1933. Approximately 50-percent mortality from fungous disease was obtained with either form in pure culture. Maximum mortality from fungous disease occurred about 5 weeks after infection was attempted. Coating the wireworms with spores of the fungus before placing them in the salve boxes gave no better results than inoculation of the soil in the 1-pound coffee cans. The indications were that wireworms may be susceptible to infection only at the time of molting. When mixed cultures of the green-spored *Metarrhizium* and brown-spored *Metarrhizium* were used as the infective agent there was a significant increase in the mortality from fungous disease. There were also indications that union between these forms of *Metarrhizium* may have occurred within the bodies of the living wireworms.

Preservation of food samples by quick freezing for use in European corn borer nutrition studies.--G. T. Bottger, Toledo, Ohio, reports that quick freezing of green plant tissue with CO_2 (dry ice) provides a convenient and entirely satisfactory means of preserving a composite sample of corn tissue for supplying homogeneous food for test larvae during the entire course of their development, thus enabling one chemical analysis to represent all of the food utilized in each experiment. Although freezing would not be likely to cause modification in the constituents in the corn tissue sufficient to affect the interpretation of biological results on a comparative basis, it was established that the total sugar and nitrogen content of green corn tissue is not appreciably affected by freezing, a fact which should greatly broaden the general utility of this method.

Synthetic food for nutrition studies with European corn borer larvae.--G. T. Bottger, Toledo, reports average survivals and weights of surviving larvae after feeding exclusively on synthetic food for 10, 20, and 30 days after hatching, as follows: For survivals of 19.0, 7.0, and 2.5 percent, respectively, the average weights per larva were 2.7, 14.6, and 32.6 milligrams, respectively. One of the test larvae confined to synthetic food continued to feed and grow after attaining an age of 30 days and reached a maximum weight of 89.0 milligrams when 38 days old. The growth rate is slower than that of larvae nourished on green plant media adapted to the borer's requirements, but the maximum weight attained is considered normal and the larva apparently has entered the diapause which normally precedes pupation in single-generation borers. The synthetic medium was formulated to simulate the chemical constituents of green sweet corn kernels. Commercial cellulose cotton provided the fiber, which serves as a carrier for the moisture, carbohydrates, protein, and mineral matter.

Sweet corn resistance to European corn borer.--Reporting on tests conducted in 1938, M. Schlosberg, Toledo, says: "During 1938, 427 inbred strains of sweet corn were entered in the field tests to study sweet corn resistance to the European corn borer. The entries were divided among types as follows: Bantam, 335; Country Gentleman, 50; Evergreen, 42. The performance of the strains was evaluated with the aid of the multiple regression analysis to adjust for varying experimental conditions, such as differences in maturity, height, and natural infestation, all strains within type being uniformly infested with eggs at a rate of 3 egg masses per plant to provide a measurement of larval survival on the respective entries. Of the Bantam strains, 9 showed significant negative departures in larval survival and 68 others indicated a trend toward resistance warranting further observation. Similarly, 1 Country Gentleman strain showed a significant negative departure and 11 indicated a trend toward resistances; and 2 Evergreen strains showed a significant departure and 2 indicated a trend toward resistance. Among the Bantams, Mich. 1828 was outstanding in its resistance performance, as it was in the more extensive tests conducted in comparison with the performance of Conn. 2, to determine its resistance over a wide range in its development at time of infestation."

Estimates of damage by European corn borer in 1938 and comparison with 1937 estimates.--A. M. Vance, Toledo, reports that in the Lake States area in 1938 the loss caused by the corn borer to corn harvested for grain was estimated at $594,495 (83.3 percent of the entire loss in that area) and to sweet corn at $119,140 (16.7 percent), or a total of $713,635. In the Eastern States area in 1938 the loss caused by the corn borer to corn harvested for grain was estimated at $220,376 (25.2 percent of the entire loss in that area) and to sweet corn, at $652,822 (74.8 percent), or a total of $873,198. The average calculated loss of crop by the corn borer in 1938 for the entire area considered, based on the application of damage indices to populations of the insect, was 7 percent in corn harvested for grain and 13.3 percent in sweet corn. The average per acre loss in 1938 for grain corn was estimated at $0.60 and for sweet corn at $23.20. In comparison, the average per acre loss in 1937 for grain corn was estimated at $0.33 and for sweet corn, at $22.46. On the basis of all available information, the total damage caused by the European corn borer in 1938 over the greater part of the infested territory is placed conservatively between 2 and 2½ million dollars.

Genetic studies of European corn borer in 1938.--K. D. Arbuthnot, New Haven, Conn., reports that all crosses of Toledo and New Haven stock material have now been obtained in the laboratory. Crosses inter se with New Haven material are obtained most readily, followed in order by Toledo material, Toledo females and New Haven males, and New Haven females and Toledo males. As egg production from related pairs of moths is variable within a wide range, its significance as a measure of biological differences between strains must be studied carefully before interpretations can be made as to its utility. Measurable differences in the time of incubation of eggs may serve as one means of differentiating between inherently different strains. The New Haven field material has shown every evidence of being homozygous for nondiapause (multiple-generation character). The Toledo field material appears to be a mixed race in which the percentages of diapausing and nondiapausing larvae vary greatly between the progeny of different pairs of moths. Evidence that there are homozygous diapausing individuals was found in the progeny of one pair. Nondiapause has been shown to be dominant to diapause but their relation in inheritance was not discovered. The isolation of a homozygous single-generation (diapausing) strain has been greatly hindered by a lack of information on how to handle diapausing larvae to obtain pupae and moths for successive generations. Some progress has been made in this phase of the investigation.

JAPANESE BEETLE CONTROL

Methyl bromide fumigation praised by nurseryman.--The following quotation from an article appearing in the May 1939 issue of Horticultural Topics, a publication of the N. J. Association of Nurserymen, illustrates one nurseryman's experience with methyl bromide fumigation: "Construction of a gas box at a cost of slightly more than $100 by the Koster Company at Bridgeton, has made possible the application of methyl bromide treatment to $3,000 or $4,000 worth of nursery stock which could not otherwise have been sold, according to C. Courtney Seabrook. He gives the following details about his firm's utilization of the new method of fumigating stock for shipment outside the Japanese beetle quarantine area. 'We started to build our gas box on a Monday morning and had it ready for our first treatment by Friday afternoon. We built our box on 2 4" x 6" skids so that it can be moved easily and also can be loaned to one of our neighbors. The box has 100-cubic-feet capacity and cost • • $102.22. In addition to the above costs of the box, we bought a 50-pound cylinder of methyl bromide which cost us $45.91 delivered. Our box can treat 20 flats containing 1,000 6"-8" lining out Azalea mollis or 150 6"-8" Hinodegiri or 25 18" rhododendrons in 1 treatment. Additional labor, electricity, gas, and other items are about $3.00, as compared with $14.50 for the same number of plants by the old paradichlorobenzene method. We place the plants in our box the night before and leave it on all night so that the soil will have the correct temperature for treating the next morning. So far this spring we have probably treated $3,000 or $4,000 worth of material which we could not otherwise have sold, as the cost of treating the same material with paradichlorobenzene would have been prohibitive.'"

Inspections on the Eastern Shore of Maryland.--In the Salisbury, Md., district inspections of nursery stock reached their maximum in April. One nurseryman in the Salisbury area has installed a washing machine to facilitate cleaning and certification of their plants from infested fields. The washer used was originally utilized in cleaning sweetpotatoes, but with the installation of pressure nozzles over the endless belt, it was readily adapted to the cleaning of strawberry plants. The plants are placed on the endless belt. As they pass through the washer they are drenched with fine streams of water from all angles. The plants then move out of the bath onto a long table where they are inspected and placed in baskets for tying.

North Carolina soil treatments about completed.--During the month, applications of lead arsenate were made to over 200 acres at and surrounding known Japanese beetle infestations in North Carolina. The cooperative State-Federal treatments started in Winston-Salem and Greensboro on March 27 were completed on April 12 and 19, respectively, with 69.7 acres sprayed in Greensboro and 52.4 acres treated in Winston-Salem. Additional treatments in North Carolina were made as follows: Charlotte, 6.1 acres, April 18-26; East Spencer, 12.9 acres, April 22-30; Elizabeth City, 3.9 acres, April 25-29; Raleigh, 3 acres, April 29-30; Sanford, 10 acres, April 13-24; Spencer, 34.1 acres, April 13-28; and Wilmington, 19.9 acres, April 5-29. Treating work in Raleigh continued into May. In addition to the soil treatments in North Carolina, Bureau-owned spray trucks and supervisors from this Division assisted in the application of State-purchased lead arsenate to 4 acres in Conneaut, Ohio. Further treatments in Ohio continued into May.

Road stations begin operations.--During April 17 highway vehicular stations were established. On the first of the month, 5 posts in Virginia and 2 in West Virginia were opened. In Ohio 9 stations were established, 5 on April 17, 2 on April 18, and 1 each on April 20 and 22. A single station was established in Pennsylvania on April 22. The first interception of Japanese beetle larvae in plant material inspected at the road posts was made on April 8. This consisted of 3 larvae in soil accompanying perennials purchased at Baltimore, Md., for movement to Stanley, Va. During the month 12 infested shipments were intercepted, from which were removed 23 larvae, 1 pupa, and 1 adult.

Methyl bromide demonstration.--A demonstration of the new methyl bromide fumigation procedure was given on April 20 at the New York School of Agriculture at Farmingdale, Long Island. Arrangements for the demonstration were made in cooperation with A. B. Buchholz, of the New York Department of Agriculture. Numerous plant growers and other interested parties attended. Tests with this fumigant have continued with favorable results in New Jersey. Several of the larger nurseries are carrying on independent trials with many different plant species to determine whether the various kinds of plants may be safely fumigated with this material.

Interdivisional Japanese beetle trapping.--During April, 1,344 Japanese beetle scouting traps were distributed in lots of a dozen each to field stations of the Bureau in 27 nonquarantined States and 6 partially regulated States. These traps will be set up and tended by the personnel at the various field stations. All beetles trapped will be forwarded to the Bloomfield, N. J., field headquarters for identification.

Exhibit material heat treated.--An eagle's nest, several old and rotted stumps, 15 bags of leaves, and several swallows' nests were submitted to the district inspector at Portland, Maine, for inspection and certification prior to shipment to the New York World's Fair for use in the State of Maine exhibit. Since it was impracticable to inspect these articles for gypsy moth egg clusters the State arranged for the use of a lumber kiln near Auburn, where the articles were heat treated under the supervision of the district inspector. The first lot of nursery stock offered for inspection this spring in the Portland district was examined on April 24. There was considerable frost in the ground in some sections of this district at the end of the month.

Cold weather delays nursery inspection season and gypsy moth hatching.--Continued cold weather has delayed nursery inspection throughout New England from 2 to 3 weeks. None of the district inspectors have observed hatching of gypsy moth egg clusters, whereas in 1938 hatching of egg masses was reported on April 27 in Connecticut, New Hampshire, and Rhode Island, and on April 28 in Vermont. Indications at the end of the month were that the egg clusters would not hatch for at least 10 days or 2 weeks. As soon as hatching starts, all nursery stock presented for inspection and certification must be sprayed, owing to the hazard of its becoming infested with wind-blown larvae.

Additions to inspection corps.--During the month 13 temporary gypsy moth inspectors were added to the New England personnel--1 in Rhode Island, 3 in Connecticut, 2 in Massachusetts, and 7 in Maine. At a forest nursery in western Maine, the ground did not thaw sufficiently to permit digging of nursery stock until April 26. The district inspector in the area and 7 temporary inspectors were immediately assigned to this establishment, since all its shipments must be inspected and certified within the brief period during which the stock is sufficiently dormant for replanting.

City-owned lumber inspected.--During the hurricane of September 21, 1938, the city of Concord, N. H., lost over 1,000,000 board feet of standing timber in the public parks and on water-department land. This was sawed during the early winter and stored in open lots. Over 500,000 feet of this was sold in April to a shipbuilding corporation in Camden, N. J. Seventy-five thousand feet of this lumber has already been inspected and certified for shipment.

Confirmations outside previously known infected area.--Confirmation on April 11 of samples taken from a devitalized elm located in Upper Freehold Township, Monmouth County, N. J., added 198 square miles to the infected zone and increased the work area by 114 square miles. The total number of square miles in the New Jersey Dutch elm disease work area is now 4,112, with 3,610 square miles in the infected zone and 502 square miles in the surrounding protective zone. This first-record confirmation added the townships of Bordentown, Chesterfield, New Hanover, and North Hanover, the boroughs of Bordentown and Chesterfield, and the city of Bordentown, all in Burlington County, and Plumstead Township in Ocean County to the work area. Another first-record confirmation was received during the month from Tinicum Township, Bucks County, Pa. This location is 1.1 miles north of Point Pleasant, along the Delaware River.

Increasing W. P. A. force.--In an attempt to bring the W. P. A. workers engaged in Dutch elm disease eradication up to the number allotted for the months of May and June, referrals were interviewed late in April and some were accepted in the different work areas. Schools for training men to scout for beetle-infested trees were started at the end of April. Those who cannot qualify for this type of work will be transferred to elm-sanitation crews.

Dutch elm disease personnel.--Employees of the Dutch elm disease eradication projects at the end of April numbered 66 regular appointees, 129 W. P. A. appointees, 6 men on the regular per diem payroll, 3,434 W. P. A. workers, 15 State-appointed officials, and 48 State per diem workers, a grand total of 3,698 men.

Reconnaissance survey completed.--A reconnaissance survey by autogiro ground crews was completed on April 19. The entire project involved coverage of 540 linear miles of strips, a total area of 8,640 acres, or 13.5 square miles, in the States of Connecticut, New York, and Pennsylvania.

FOREST INSECT INVESTIGATIONS

Low winter mortality of eastern hemlock borer in Wisconsin.--In order to obtain data on winter mortality of the hemlock borer, observations were made at the Menominee Indian Reservation in December, February, and April. As a result of these observations, H. C. Secrest, Milwaukee, reports that this mortality is of little importance, being about 3 percent for the large larvae and 10 percent for the small. Larval activity was evident on April 27, and some of the largest larvae, those in cells in the bark, appeared to be entering the prepupal stage. An appreciable number of early instar larvae were found between the bark and the wood.

Tests with sprays for broods of elm bark beetle.--R. R. Whitten, Morristown, N. J., has submitted a progress report on experiments he is conducting with lethal oil sprays for the control of the two elm bark beetles, Scolytus multistriatus Marsh. and Hylurgopinus rufipes Eich. Although these experiments have been limited, they indicate that such sprays have promising possibilities when applied to elm logs infested with the larvae of the bark beetles. The bark of logs in which the larvae were in various stages of development was sprayed with different mixtures at different times of year. Mr. Whitten has found that (1) mature larvae are more susceptible to the sprays than younger larvae, (2) sprays applied under winter conditions are not as effective as when they are applied in May or June, (3) orthodichlorobenzene applied at the rate of 1 part to 4 parts of a penetrating oil carrier was the most effective agent tested, and (4) a penetrating oil was the most effective carrier used, although water with an emulsifier showed promise.

High parasitization of elm bark beetle.--W. C. Baker, Morristown, has noted an instance where the smaller European elm bark beetle (*S. multistriatus*) was heavily parasitized by a hymenopteron, *Cheiropachys colon* Westw. From an elm branch collected on March 17 at Beekman, N. Y., 140 adults of the parasite and 24 adults of the beetle emerged. Unfortunately the branch had been attacked by woodpeckers before it was collected and a more accurate determination of the percentage of parasitization could not be made.

Mountain pine beetle control in white pine stands of northern Idaho.--Artificial control measures for the reduction of localized outbreaks of *Dendroctonus monticolae* Hopk. in valuable white pine stands of the Kootenai and Clearwater National Forests were instituted in April. Those two projects call for an expenditure of approximately $35,000, with the employment of more than 200 men during a 6-week period. The Clearwater project is the larger operation, requiring an expenditure of $25,000, which will be borne in part by the Clearwater Timber Protective Association in payment for the treatment of trees on lands under their protection. These projects are under the direct administration of the Forest Service, with forest-insect laboratory of the Bureau of Entomology and Plant Quarantine acting as technical adviser. W. D. Bedard spent the period from April 17 to 26 on the Kootenai National Forest, assisting in the training of personnel and in designating boundaries of the areas to be treated. T. T. Terrell will spend all of May and part of June on the Clearwater National Forest assisting in the training, supervision, and direction of spotting crews, the checking of treating, and the designation of area boundaries.

Salmon River infestation.--During the latter part of April, T. T. Terrell, Coeur d'Alene, Idaho, spent several days in making a rather thorough examination of an infestation of the western pine beetle in an area of ponderosa pine near Riggins, Idaho. This area is located on the so-called dry breaks of the Salmon River, where the timber sites are somewhat marginal. Mr. Terrell found that, although the western pine beetle was primarily responsible for the severe losses that have occurred during the last 2 years, a buprestid beetle, *Melanophila* sp., had destroyed many of the smaller trees and was also attacking with the more primary pine beetle. A deficiency in precipitation during the past few years is believed to be responsible for leaving the trees weakened and therefore susceptible to outbreaks of these insects. At present the losses have so decreased that control measures are not considered necessary and it is believed that a return to normal precipitation will end this disturbance.

W. P. A. controls bark-beetle infestation on private lands.--Dwight A. Hester, Fort Collins, Colo., reports that an area of about 60 sections containing approximately 2,700 ponderosa pine trees infested with the

Black Hills beetle is now being treated by W. P. A. crews. This area is privately owned and lies northeast of Bailey, Colo., and adjoins the Pike National Forest on the south and west sides. To date about 500 trees have been treated by the peeling method and the work is progressing satisfactorily. The labor is being furnished by the W. P. A. office in Denver and the sponsors for the project include the State entomologist, the United States Forest Service, and the Denver Mountain Parks Improvement and Protective Association. The sponsors' funds are made up of donations from the State, the Forest Service, the City of Denver, the Denver Water Board, the Bell Telephone Company, and Public Service, and of private donations collected by the Denver Mountain Parks Association. These funds are being spent for equipment, rental and maintenance of camps, and for the hiring of trained men who act as foremen for the W. P. A. laborers. The project is being carried on under the technical supervision of the Fort Collins laboratory of the Bureau. Control measures have been undertaken on the north, west, and south sides of this project area during the last 2 years. As the infestation does not extend eastward from this area, it is hoped that this work will check an extensive infestation which has been evident for the last several years.

Types of Black Hills beetle galleries.--Anyone acquainted with the galleries made by the Black Hills beetle must have wondered why some galleries start out with a right crook and some with a left crook. Why such is the case is still not known, but studies at the field station of the Fort Collins laboratory in 1938 showed that there was a significantly greater number of galleries with right crooks than with left crooks. This was found to be true for the three common host trees in the Rocky Mountain region, Pinus ponderosa, P. contorta, and P. flexilis. As with other animals, abnormal habits occur at times with individual Black Hills beetles. The normal female beetle after once completing the initial crook, extends her gallery up the tree with the grain of the wood, even to the point of following the grain around knot swellings and the twisted grain in spiral-grained trees. A few abnormal females, however, seem to have lost their negative-geotropism and extend their galleries, sometimes right from the start, down the grain of the trees. Such habits as those mentioned above may seem to be without any economic significance whatever, but changes in the frequency of such habits may be found to indicate a change in status of an outbreak and consequently enable one to judge better the measures needed to combat the insect.

Black Hills beetle larger in ponderosa pine.--Donald De Leon, Fort Collins, reports that the Black Hills beetle in ponderosa pine is significantly larger in size than the same species from limber pine, and those from limber pine are larger than those from lodgepole pine. The greatest brood per square foot, however, is found in limber pine, with the next largest brood being found in ponderosa pine. It is to be expected that larger broods would be found in the tree species with the thickest phloem, but no explanation can be given unless it could be differences in the nutritional value of the phloem, for the differences in size of the beetles from these three trees.

LIBRARY
STATE PLANT BOARD

GYPSY MOTH AND BROWN-TAIL MOTH CONTROL

Snowshoes wear out rapidly in mountains of Vermont.--The most severe snowstorm of the season in the Vermont, Massachusetts, and Connecticut gypsy moth areas occurred on April 3 and 4. The snowfall averaged from 10 to 12 inches in depth on the high elevations of northwestern Connecticut and in the Berkshire Mountains in Massachusetts, while 18 to 24 inches of snow fell in the Green Mountains of Vermont. The deep snow has caused considerable damage to snowshoes used by gypsy moth scouts, particularly on the high elevations of Vermont where snowshoes have been in constant use since last December. A crust forms during the night which cuts the webbing of the snowshoes. As the temperature rises during the day, the crust gradually disappears, the snow becomes soft and wet, and the rawhide webbing softens and stretches. The wet snow slowly works through the webbing and gathers on the surface of the snowshoes, weighting them down so that the wearers soon tire. It is estimated that approximately 125 pairs of snowshoes have been worn out this season in the Vermont area alone. Although the snow practically disappeared from the fields and southern slopes of hills in Vermont during the last 2 weeks in April, several feet of snow remained on the upper slopes, especially on densely wooded northern exposures.

Restrictions on brush burning increased.--During the last few weeks the burning permits have been restricted to periods of 10 days or less. Now, because of the forest-fire danger resulting from the recent hurricane, fire wardens in Vermont, Massachusetts, and Connecticut have been instructed to issue no permits for burning until the danger of fire has passed, except under special conditions and then for 1 day only.

Weather stations set up in three States.--Weather stations for recording meteorological data were set up in Westfield, Mass.; in Milan and Berlin, N. Y.; and in Clarendon, Vt., in the latter part of April. Arrangements have been made to have each station visited at least once every day during their operating period, which will end about June 1, for the purpose of checking up on the operation of the machines, making necessary minor repairs and changing charts. The records from those stations are used in determining possible dispersion of the small gypsy moth caterpillars by the wind.

Supervisory employees instructed in first aid.--Instructions in first aid were given to gypsy moth supervisory employees assigned to duty in Vermont, Massachusetts, Connecticut, and Pennsylvania in April. These men will, in turn, instruct the crew foremen working under their supervision as to approved methods of making splints and applying bandages.

Preparations for gypsy moth spraying in western Massachusetts.--Preparations for the erection of temporary barbwire fences, designed to prevent cattle from grazing in areas which will be sprayed with lead arsenate solution later in the season, were made in several localities in western Massachusetts in April. Brush was removed along one set of proposed fence lines and fence posts were cut. The posts will be placed in position as soon as the frost is out of the ground sufficiently to permit them to be driven. Rolls of barbwire were distributed along a proposed fence line about 1½ miles from the nearest highway by three men who used a small shop-made trailer drawn by a tractor. If the same task had been performed by hand it would have taken twice as many men 3 days, as the country is rugged and the fence extends across steep slopes about 1,300 feet in elevation.

Nurseries very active on Long Island.--The movement of nursery stock from the section of Nassau County, Long Island, N. Y., that is regulated on account of the gypsy moth continued to be very active during April. Besides filling their customary orders, the nurseries have made many large shipments to the New York World's Fair grounds. The heavy increase in business by the nurseries has made it necessary to increase the number of men assigned to inspecting the plants for the gypsy moth.

Gypsy moth infestation apparently exterminated.--Check-up work in the vicinity of the gypsy moth infestation located in the township of Damascus, Wayne County, Pa., during the fiscal year 1938 was recently completed with negative results, and the colony has apparently been exterminated. This infestation was situated at a point about 40 miles northeast of Pittston, which is considered the approximate center of the original infestation in that State, and was farther from the center of infestation than any other outlying colony in the Pennsylvania area.

Spraying preparations in progress in Pennsylvania.--During the latter part of April several agents were detailed to obtain spraying permits in residential areas in Pennsylvania in which gypsy moth spraying work will be started as early in May as foliage development will permit. In previous years the residential spraying was begun about May 18, but this year all signs indicate that the foliage may be considerably delayed. In residential sections of Wilkes-Barre and Plains Townships 866 permits for spraying were obtained during the last week in April, and many more must be obtained before spraying begins. It is estimated that 7 sprayers will be needed to treat the infestations found in residential sections in the Susquehanna and Lackawanna Valleys this year, and an equal number will be required to wash the spray mixture from the buildings and fences immediately after the spraying is done. Supplies of burlap, used for banding trees at infested locations, were distributed in the field during this period. The burlap bands will be used in areas where no spraying work is planned for this year. Arrangements have also been made for most of the fencing work necessary around areas to be sprayed, and some barbwire had been distributed by the end of April.

Clean-up of railroad sidings an important gypsy moth control measure.--As approximately 50 percent of the anthracite coal production of Pennsylvania is mined in the section of the State included in the quarantined area, railroad sidings are numerous throughout the district. Many of these sidings are in business or industrial centers where no tree growth exists, but many others are so located that trees or brush normally line the sidings. Since the gypsy moth was found in the State this forest growth has been removed periodically and the sidings kept clean so that the dispersion of the gypsy moth through transportation in railroad cars may be prevented. The movements of railroad equipment likely to harbor the insect are also carefully checked. In order to facilitate this work, a regular employee of this project has recently been engaged in mapping all railroad sidings located within the quarantined area.

C. C. C. gypsy moth work in Connecticut.--The outstanding accomplishment in C. C. C. gypsy moth work during the last quarter is the large number of egg clusters creosoted or burned in the Granby-Simsbury-Canton area in Connecticut. An estimated total of 3,222,314 egg clusters were treated, approximately 1,361,400 of which were destroyed by burning in piles of debris. Up to April 1 of this fiscal year, 5,218,679 egg clusters were destroyed in this area. A large portion of this figure is an estimate count. Egg clusters are actually counted when they are scattered, but when large numbers occur together on tree trunks and on the under side of limbs the figures are obtained by estimate. It is believed that, with the experience the men have had, the estimate is as accurate as can be made in a very dense infestation. An idea of the degree of infestation in this section is obtained by considering that this great number of egg clusters were treated in an area of only 445 acres, and that the work is not yet completed in some of the sections. By cooperation between this Bureau, the C. C. C. organization, and the Connecticut State Forest Service, a large part of this area will be sprayed during the approaching gypsy moth larval season.

PLANT DISEASE CONTROL

Three million barberry bushes destroyed in West Virginia since January 1.--According to Tom Van Zandon, in charge of barberry eradication in West Virginia, 3,000,000 Berberis canadensis and approximately 1,000 B. vulgaris were destroyed in that State during the last 4 months. Of these, 60 percent were treated with salt brine and 40 percent were eradicated with dry salt, 137 tons of salt being used at the rate of 120 pounds per square rod of area infested with barberry bushes. During the summer months from 90 to 100 pounds per square rod are adequate to obtain a 100-percent kill.

Results of educational work in Ohio.--Harry Atwood, State leader in Ohio, reports that during 1933 54 barberry locations were reported by school teachers, children, former barberry-eradication supervisors, former security-wage earners, county agricultural agents, nursery inspectors, and farmers. These were distributed throughout 20 counties and represented more than 10 percent of all infested properties found during the year.

Results of intensive survey in four counties in Indiana.--Stanley Castell, in charge of barberry eradication in Indiana, reports that in 4 counties in that State, where an intensive survey has just been completed, 9,000 barberry bushes were destroyed on 75 properties. Each of these counties had received a preliminary survey prior to 1933. The following table shows a comparison of the number of bushes and properties found prior to 1933 with the number of new properties and bushes found in the survey just completed.

County	1918 - June/30/33				July 1/33 - 1939			
	Properties		Total bushes		Properties		Total bushes	
	City	Rural	City	Rural	City	Rural	City	Rural
Carrol----------	16	31	22	25,832	1	12	1	3,345
Fulton----------	7	13	9	491	2	6	24	5,176
Huntington-----	45	10	129	31	7	5	27	28
Miami-----------	15	13	21	144	8	34	11	450
Total-----	83	67	181	26,498	18	57	63	8,999

Four hundred thousand barberries destroyed in southwestern Colorado since January 1.--E. A. Lungren, in charge of barberry eradication in Colorado and Wyoming, reports that 82 security wage earners have made an intensive survey since January 1 of 216 square miles in Archuleta, La Plata, Montezuma, and Montrose Counties, Colo., with the result that 423,000 barberry bushes, *Berberis fendleri*, have been destroyed on 11 different properties. On April 15 a survey was begun in an extensive area of *Berberis vulgaris* in Montrose County.

Phenological data.--Ray R. Hirt, of the New York State College of Forestry, Syracuse, N. Y., reports: "While in Warrensburg, N. Y., on April 27 and 28 I examined many blister rust cankers on both reproduction and older trees but found no cankers developed, even to the point of having any small swellings where the season's aecia will appear. The season is very backward, forest soil is still frozen, with snow in the forest. *Ribes* bushes in the open are breaking their buds. In the vicinity of Syracuse aecia were just breaking through pine bark on April 22, 1939." F. A. Patty and J. N. Mitchell, of the Oakland, Calif., blister rust office, in recording *Ribes* phenology, observed several cases where leaves of *Ribes roezli* had remained undefoliated and green over winter on bushes that had been buried under from 5 to 6 feet of snow at an elevation of around 6,500 feet. This indicates the possibility of occasional overwintering of the rust on *Ribes* during a mild winter.

State-sponsored W. P. A. blister rust control projects.--In the Southern Appalachian Region two States, North Carolina and Virginia, have State-sponsored W. P. A. blister rust control projects. In North Carolina the project, which was sponsored by the division of entomology, State Department of Agriculture, provides funds for work in Avery, Mitchell, and Watauga Counties. Work on this project was begun the latter part of February. The State W. P. A. blister rust control project in Virginia was sponsored by the bureau of plant industry, of the Virginia Department of Agriculture and Immigration. Work was begun the latter part of January.

New England townships cooperate in blister rust control.--At recent town meetings in New England, 35 townships in New Hampshire and 45 townships in Maine appropriated a total of $16,325 for cooperative blister rust control work. This represents a decrease of about 25 percent in the amount of town cooperation provided last year in New Hampshire and is probably due largely to the effects of the hurricane. In Maine 6 more townships cooperated this year than in 1938. Considering the extent of damage in New England from the hurricane, the cooperation of the townships in blister rust control work, as indicated above, is considered very good.

Checking nursery for *Ribes* after lapse of two years.--H. N. Putnam reports that a check for *Ribes*, which he and Mr. Bergeson made in April around an Illinois nursery, proved particularly interesting because it seemed to indicate the feasibility of checking nursery sanitation zones every 2 years after the initial work had been done rather than checking annually. The protective zone around this nursery had not been checked since 1937. It was an ideal time of year for the work, as the *Ribes* were in leaf well ahead of the associated vegetation. Control work around this nursery consists entirely of reworking several miles of Osage-orange hedges. Work was first carried on around the nursery in the spring of 1936, at which time 1,600 large *Ribes missouriense* bushes were found in the hedge rows. After this initial work was done the sanitation zone was checked and 131 bushes, mostly sprouts, and a few seedlings with a total of 197 feet of live stem were found and removed. In 1937 the sanitation zone was again checked and 39 bushes, mostly sprouts, were found. This spring, after a lapse of 2 years, a total of 614 bushes containing 700 feet of live stem were eradicated. Nearly all of these bushes were 2-year seedlings averaging about 1 foot of live stem each and thus plainly visible. It was interesting to note that these seedlings were found almost entirely at the same locations where large bushes had been found previously and on sites that had either been burned over or disturbed by the cutting back of the Osage-orange hedges. There are approximately 300,000 white pines of 2-0 stock and 40,000 of 2-1 stock in the nursery. Enough beds are being seeded to white pines this spring to produce 200,000 plants. Approximately 50,000 white pines had already been sold for distribution within the State this spring.

COTTON INSECT INVESTIGATIONS

Sweeping versus "shagging" to determine mirid population on cotton.--Different methods of determining the population of the mirids *Adelphocoris rapidus* (Say), *Lygus pratensis oblineatus* (Say), and *Psallus seriatus* (Reut.) on cotton have been tested. At Tallulah, La., in 1937 the infestation or population records made by counting all of those mirids collected per 100 sweeps with a net across the tops of the cotton plants through the center of each plot showed that about 3 times as many mirids were taken per 100 sweeps as were observed by examining 75 plants (25 plants in the center and at each end of the plots). In the sweepings more adults than nymphs were taken, and in the plant examinations more nymphs were observed than adults. This difference in the 2 methods was to be expected, as the adults readily take to flight when the cotton plant is disturbed, making the adults more likely to be taken in the sweeping net and less likely to be observed in examining the plants. Since a much larger number of mirids were collected by sweeping with a net, it was decided to discontinue the method of determining the infestation by counting the insects on the plants in 1938. However, since the sweeping method may not give a reliable index as to the nymphal population of the plots another method of making population counts or infestation records was tested. This is the "shagging" or "hoop and bag" method that has been used for collecting boll weevils from cotton plants. The upper part of the plants are shaken over a canvas bag fastened around a rigid iron hoop. The infestation record was made by making 100 "shags" per plot at the same time 100 sweeps were made with the net. A total of 1,100 sweeps and 1,100 "shags" were made. The results of these tests are summarized by

G. L. Smith and A. L. Scales as follows: "The ratio of the number of mirids collected was approximately 60 to 40 in favor of the shagging method when shags were made with a boll weevil collecting hoop and bag, as compared with sweeps made with an ordinary insect collecting net. Also the ratio of adults to nymphs taken by shagging was about 60 to 40, whereas with the sweeping net it was about 75 to 25. These results indicate that the shagging method gives a slightly better index to the nymphal mirid population than does the sweeping method. Shagging is done more quickly than sweeping. Incidentally, in shagging this cotton 2,604 boll weevils were taken, as compared to 554 taken by the same number of sweepings with a net. In 1938 the only mirids counted were A. rapidus and L. pratensis, as these are the members of the family ordinarily injurious to cotton in the vicinity of Tallulah. The true cotton flea hopper, P. seriatus, is usually present but is seldom a serious pest in that locality. Of the 1,308 mirids collected in the plots during 1938 there were 836 (535 adults and 301 nymphs) of A. rapidus and 472 (321 adults and 151 nymphs) of L. pratensis."

Field-plot control tests for mirids and boll weevil.--G. L. Smith and A. L. Scales, of the Tallulah laboratory, report the average yields in two sets of field-plot tests in Madison Parish, La., in 1938, as follows:

Treatment	Average yield per acre of seed cotton	Average increase per acre of seed cotton	
	Pounds	Pounds	Percent
Check	1,354.5	--	--
Sulfur	1,459.5	105.0	7.2
Derris-sulfur 1:7	1,525.5	171.0	11.2
Ca. ars.-sulfur 1:1	1,842.5	488.0	26.5
Calcium arsenate	1,793.0	438.5	24.5

The fields in which these tests were made were selected because the rapid plant bug (A. rapidus) and the tarnished plant bug (L. pratensis) were fairly abundant about July 15. However, during the wet season that followed for about 30 days, these mirids did not increase very much, while the boll weevils did increase, and the gains in yield from dusting with calcium arsenate and the mixture of calcium arsenate and sulfur were due chiefly to boll weevil control. Each field was divided into five equal plots for the experiment. In the field with an average boll weevil infestation of about 36 percent when the first dusts were applied on July 13 and, with an average infestation in all plots from July 13 to August 10 of about 46 percent, there was an increase in yield of seed cotton from dusting with calcium arsenate of 38.9 percent (602 pounds per acre) and from dusting with the calcium arsenate-sulfur mixture of 34.7 percent (517 pounds per acre); while in the field with a lower average boll weevil infestation of about 31 percent when the first dusts were applied on July 13 and, with an average infestation in all plots from July 13 to August 9 of about 41 percent, the increased yield in the plot dusted with calcium arsenate was only 13.7 percent (275 pounds per acre) and in the calcium arsenate-sulfur dusted plot only 20.9 percent (456 pounds per acre). The increased yields in the plots dusted with sulfur and the mixture of 1 part of derris and 7 parts of sulfur ranged from 5.1 percent to 12.6 percent, owing largely to mirid control. Under average boll weevil and mirid conditions in Madison Parish, the dual-purpose calcium arsenate-sulfur mixtures may be more profitable than calcium arsenate, while with severe weevil infestations and light mirid infestations calcium arsenate will probably be more profitable for cotton dusting.

Hemipterous insects in Arizona greatly reduced by low winter temperatures.--The winter of 1938-39 was much colder in Arizona than the preceding winter, 1937-38. The effect of the low winter temperatures during the past winter upon the hemipterous insect population was indicated by comparing insect collections made during the last week of April in each year. On April 24, 1939, T. C. Barber, Mesa, Ariz., was able to collect only 17 hemipterous insects with 800 strokes of an insect-collecting net on alfalfa, sugar beets, grains, and weeds; whereas on April 27, 1938, with 900 strokes under similar conditions, he collected 429 hemipterous insects. Following a cold winter (1938-39) an average of 2.1 insects were collected by each 100 strokes of the net; whereas following a mild winter (1937-38) there were collected 47.7 insects per 100 strokes. The hemipterous insects were apparently more than 22 times as abundant in the spring of 1938 as they were in the spring of 1939. The insects forming the greater part of these collections were *Lygus* spp., *Geocoris* spp., *Nabis ferus* L., and *Creontiades femoralis* Van D.

PINK BOLLWORM AND THURBERIA WEEVIL CONTROL

Control program in Arizona to eradicate the pink bollworm.--On account of the finding of reinfestation of the pink bollworm in the Salt River Valley, after a lapse of several years, a control program was inaugurated in that area after it had been placed under regulation, which called for the destruction of all cotton stalks and clean-up of infested fields and those adjacent thereto. Following the program carried on through the winter and early spring of 1938-39, activities referred to as the "spring program" were begun on April 10, consisting of a continuation of the work previously carried on and with the additional control measure of the elimination of all stub or volunteer cotton in a still greater area, in order to create a starvation period for any possible emerging pink bollworm moths prior to the fruiting of the 1939 cotton crop. The delayed planting, on a cooperative basis, of both short-staple and long-staple varieties of cotton, was also one of the important measures recommended for this area. This control work has been carried on successfully. Cooperation on the part of farmers has been excellent; suggested planting dates have as a rule been adhered to; and it is believed that farmers in every instance, wherever possible, will hold off water from their plantings to prevent squaring and blooming until June 15, another measure recommended in the plan for pink bollworm eradication in this area. Grubbing crews were placed in the fields on April 17 to take out scattered volunteer cotton that had been missed by sledding and plowing or which it was impossible to remove in that manner because of being on ditch banks or other inaccessible places. During April, 7,800 acres were sledded and cleaned and 4,090 acres had been covered by the grubbing crews. The Agricultural Adjustment Administration issued a regulation on April 29 requiring the destruction of all stub cotton by May 10 in the area east of a line south through Tempe and south of the Salt River in Maricopa County, in all of Pima County, and in all of Pinal County. This regulation was issued on recommendation of the Bureau and the State entomologist of Arizona. It was issued under authority of Paragraph (1) (a) of Section 16 (a) of the Arizona Handbook for 1939, following the determination of the A. A. A. that failure to destroy the stub cotton will constitute a practice which defeats the purposes of the 1939 Agricultural Conservation Program. The penalty for failure to observe the regulation will be a deduction of 4 cents per pound of the normal yield per acre for the farm for each acre of volunteer short-staple or American-Egyptian cotton not destroyed by May 10.

The Big Bend area.--The heavy increase in pink bollworm infestation in the Big Bend of Texas and adjacent Ojinaga district of Mexico, in the 1937 crop, made it imperative to inaugurate a special control program, referred to as the "2-year plan," for those districts, in cooperation with officials of the Mexican Department of Agriculture. We are now in the second year of this program, which called for early planting of cotton in the spring of 1938, followed immediately by clean-up of fields, and a delayed planting date of April 20 for the 1939 cotton crop, with the expectation that most of the worms hibernating in the ground will emerge as moths and die before the cotton fruits. The important phase of this program, calling for delayed planting on both sides of the Rio Grande, was observed and the cooperation of all farmers in the area is very gratifying. The next step in this plan will be the elimination of all soca or sprout cotton plants from the 1938 crop, which might furnish fruit upon which the pink bollworm could maintain itself and produce numbers to damage the main crop. Destruction of sprout plants is expected to get under way about May 1.

Inspection.--In the lower Rio Grande Valley of Texas a control program for the eradication of the pink bollworm has been carried on since the discovery of that pest in 1936 in that area and in adjacent areas of Mexico across the Rio Grande. Similar control measures have been carried on by the Mexican Department of Agriculture in the affected areas of that region, in cooperation with this Division. In that mild climate cotton plants are seldom killed by frost, but remain alive all winter, thus normally providing a host for the pink bollworm throughout the year. Control measures for this area provide for the sterilization of seed, cleanup of points of concentration, and the immediate destruction of cotton plants after the crop has been picked, thus providing a host-free period of about 6 months for the pink bollworm. Therefore, the outstanding event in this area in April was the examination, with negative results, of 10,092 fruiting forms, consisting of squares, blooms, and small bolls, in the Brownsville area of that district, and 4,075 forms in the adjacent Matamoros area of Mexico in cooperation with Mexican inspectors. Inspections in the Brownsville-Matamoros area were confined as nearly as possible to those fields known to be infested in 1938, or fields in close proximity. Examination of soil samples was also made during the month in the Brownsville area, and similar examinations were made in the Matamoros section in cooperation with Mexican inspectors. Soil samples were taken from the gin premises where first-cleaner trash is discharged, as well as where seed cotton was stored on the ground for a considerable period of time. Some samples were also taken from a known infested field of 1938. Each sample was 1 yard square and 4 inches deep. The top and bottom 2 inches of soil of each sample was washed and examined separately. These examinations were also negative. Laboratory inspection of preserved bolls at the San Antonio and field station laboratories was negative during April.

Wild-cotton eradication in southern Florida.--An eradication program has been carried on in southern Florida for a number of years for the purpose of eliminating the heavy pink bollworm infestation in that area by destroying its host--wild cotton--and thus preventing its spread to cultivated plantings in northern Florida and southern Georgia. This work has been carried on with excellent results, and very satisfactory progress was made during the month toward recleaning wild-cotton colonies for the second time during the current season. Not a single fruiting wild-cotton plant was found in the Bradenton and Fort Myers subdistricts during the second cleaning, which was carried on during April. A total of 120 acres was recleaned in the Bradenton subdistrict and only 396 seedling plants found. In the Fort Myers subdistrict 421 acres was recleaned for the second time and only 1,945 wild-cotton plants were found. In the Ten Thousand Islands section 386 acres was recleaned for the second time and only 40 plants with mature bolls and 1,650 seedling plants were found. These figures are very gratifying and indicate that the number of wild-cotton plants found in that section is on the decline. Work at Cape Sable, which was temporarily brought to a close on March 28, was resumed on April 11, and the second cleaning for the season in that section was completed on April 23. The entire Cape Sable area was cleaned twice during the season, which is now drawing to a close, because, on account of climatic conditions, effective work in this area of Florida can be done only during the fall, winter, and early spring. During the month at Cape Sable, 2,292 acres was covered and only 468 wild cotton plants with mature bolls and 15,598 seedling plants were found. This is an average of only 7 plants per acre, which is a very low average compared with former cleanings. In the Matecumbe and Key Largo sections 924 acres was covered for the second time during the season and 161 plants with mature bolls and 4,053 seedling plants were removed. In the Biscayne Bay Keys 255 acres was covered. No fruiting plants were found and only 350 seedlings were removed. In the Key West, Marathon, and Long Key sections, 151 acres was covered, 4 plants with mature bolls and 5,922 seedlings being found and removed. A light infestation of the pink bollworm was found in the Key Largo area during April.

TRUCK CROP AND GARDEN INSECT INVESTIGATIONS

Cabbage caterpillar control measures used in South Carolina inadequate.--In summarizing the data from 7 surveys made from 1935 to 1938, inclusive, of the damage caused by cabbage caterpillars in South Carolina, W. J. Reid, Jr., and C. O. Bare, of the Charleston, S. C., laboratory, report that approximately 20 percent of the total number of cabbage plants examined during the course of these surveys (constituting approximately 25 percent of the plants that otherwise would have been marketable) were classed as being ineligible for U. S. Grade No. 1, because of injury by cabbage caterpillars, despite the fact that most of the plants examined had received some type of insecticide applications by the growers. The accumulated data from the 26 fields of cabbage indicated that, in general, inadequate control was obtained by the growers and that the percentages of damaged plants ranged from approximately 2 to 63, while more than 90 percent of the caterpillars that completed their development on the plants did so after the plants had begun heading. The results of these surveys demonstrated conclusively the necessity for the growers adopting more effective control measures for cabbage caterpillars than those now in use, especially during the period of plant development. The principal species of cabbage caterpillars involved in these surveys were the larvae of the diamondback moth

(Plutella maculipennis (Curt.)), the cabbage looper (Autographa brassicae (L.)), the imported cabbage worm (Pieris rapae (L.)), the cabbage webworm (Hellula undalis (F.)), and several species of Agrotinae, including the corn ear worm (Heliothis armigera (Hbn.)).

Relation between various crops and wireworm populations.--K. E. Gibson, of the Walla Walla, Wash., laboratory, reports that during the course of wireworm-sampling operations in approximately 90 plots grown in a rotation series at the experiment station at Prosser, Wash., it was found that the plots which were in wheat in 1938 carried the highest wireworm populations, averaging approximately 11 per square foot, whereas the plots that were in alfalfa for 3 years exhibited the lowest population of any of the series, averaging approximately 2.4 per square foot. Potatoes were found to provide the best conditions for larval survival of any of the crops grown in this series, approximately 28 percent of the larvae found in the 1938 potato plots having produced adults. During the process of determining wireworm populations of 69 fields in the Walla Walla Valley, E. W. Jones found that soil that had produced potatoes in 1938 averaged the highest wireworm population, approximately 9 larvae per square foot, whereas fields that had been in alfalfa in 1938, located on well-drained land, represented the lowest wireworm populations of the series, averaging approximately 1 per square foot. It was found that onions supported relatively low wireworm populations, of 2 or less per square foot. The wireworms involved in these observations consisted principally of the sugar beet wireworm (Limonius californicus (Mann.)) and the Pacific coast wireworm (L. canus Lec.).

Frequent applications of pyrethrum-dust mixture protect turnips from injury by vegetable weevil larvae.--K. L. Cockerham and O. T. Deen, of the Sunset, La., laboratory, report that small-scale experiments in February demonstrated that Listroderes obliquus (Klug.) infesting purple-top turnips could be controlled by three applications, at weekly intervals, of a dust mixture composed of equal parts by weight of pyrethrum and talc, which contained approximately 0.51 percent of total pyrethrins. Examinations of the treated turnips at weekly intervals during the latter half of March disclosed that the vegetable weevil larvae were present in limited numbers and that the treated plants had produced a new growth. The untreated turnips, on the other hand, showed many more larvae present, even though during the latter part of the month many larvae had descended into the soil for pupation. The untreated plants appeared riddled and ragged and were not as vigorous or as free from weevil injury as those treated with the pyrethrum-dust mixture.

Susceptibility of beet leafhopper host plants affects rate of exhaustion of food reserves and vitality during overwintering period.--Physiological studies performed by W. C. Cook and C. H. Feltes, of the Modesto, Calif., laboratory, demonstrated that adults of Eutettix tenellus (Bak.) confined during the winter on sugar beets, a favorable host plant, lose fat and vitality until approximately the month of January, when they begin to lay eggs; whereas on desert saltbush or allscale (Atriplex polycarpa (Torr.) S. Wats.) an unfavorable host plant, the loss of fat and vitality is much more rapid than on sugar beets. Leafhoppers held for periods of 66 and 88 days on A. polycarpa regained their normal fat content when placed on sugar beets.

Paris green baits for mole cricket injure Italian ryegrass.--Experiments by J. N. Tenhet, of the Sanford, Fla., laboratory, disclosed that poisoned baits for *Scapteriscus* spp. which contained zinc phosphide, sodium fluosilicate, or calcium arsenate at the dosage recommended for combating these pests, did not injure Italian ryegrass, which is used very extensively on golf courses in Florida during the winter season, but that poisoned baits containing paris green, used under identical conditions, caused very severe injury to this grass. In the course of these experiments each of the poisoned baits was broadcast on the ryegrass sod at the rate of 1 pound (dry weight) of bait to each 400 square feet of sod. Two tests were made of each bait, one on unthrifty drought-injured ryegrass and the other performed on luxuriant, very tender ryegrass. The baits containing paris green caused very severe injury on all plots, but no injury was noted on any plot where baits containing zinc phosphide, sodium fluosilicate, or calcium arsenate were applied.

Four species of aphids found to transmit narcissus mosaic virus.--F. S. Blanton, of the Babylon, N. Y., laboratory, reports that tests conducted in the greenhouse and in the field have shown definitely that the virus of narcissus mosaic is transmitted by four species of aphids, namely, the bean aphid (*Aphis rumicis* L.), the potato aphid (*Illinoia solanifolii* (Ashm.)), the rose aphid (*Macrosiphum rosae* (L.)), and the aphid *Myzus convolvuli* (Kalt.). In tests made to determine the number of aphids of these species necessary to transmit the virus causing narcissus mosaic, the evidence obtained was not sufficiently complete to determine its significance. Natural transmission of the narcissus mosaic in the field in 1938 was very high, owing to the abundance of the four species of aphids enumerated. Detailed studies of the narcissus mosaic brought out the fact that, while several varieties of narcissus were more susceptible to disease than others, none of the varieties upon which observations have been made thus far are completely immune; that the disease is not spread by the picking or cutting of flowers, by root contact, or by root injury; that diseased bulbs produce inferior flowers and transmit the disease to their vegetative progeny; that bulbs once infected never recover from the disease; that the only evidence of an effective control of the bulbs infected by the narcissus mosaic is by removing such bulbs from the planting stock through the medium of "roguing" early in the season before any of the vectors have had an opportunity to transit the disease to healthy bulbs; and that thermal treatments of bulbs infected by the narcissus mosaic will not inactivate the virus, even though such treatments are performed at such a high temperature as to practically destroy the value of the bulbs.

Soil moisture and temperatures distinctly associated with injury by bulb scale mite.--Recent experiments by Ralph Schopp, of the Sumner, Wash., laboratory, have disclosed that soil moisture and temperature are distinctly associated with the presence of injury in narcissus bulbs infested by *Tarsonemus laticeps* Halbert, when the bulbs are forced in the greenhouse. The character of these environmental factors during the period when the bulbs are resting in flats preceding the actual greenhouse forcing operation was shown to determine the extent of injury by this mite. It was found that lower temperatures reduce the populations of the bulb scale mite, as well as its activity, and that increased soil moisture also decreases the mite population. Results of tests thus far indicate that there is probably some inter-reaction between these two factors. These tests were performed with potted bulbs in four different types of environmental conditions with 2° of moisture, in addition to starting one series outdoors and another series indoors.

INSECTS AFFECTING MAN AND ANIMALS

New pumping station in Florida aids control of sand fly and salt-marsh mosquito.--S. E. Shields reports that a new pumping station has just been completed and put into operation on the diked mangrove marsh opposite Fort Pierce, Fla., where control of sand flies and salt-marsh mosquitoes is being sought. This new installation, made by the Saint Lucie County Anti-mosquito District, will provide more adequate control of water levels in the 1,100-acre area now under dike. The station provides three 1½ by 5½ ft. tide-gates, to permit discharge of water from behind the dikes during low tides, and two impeller-type pumps operated by second-hand automobile engines and capable of discharging approximately 12,000 gallons per minute.

FOREIGN PLANT QUARANTINES

Airplane from Europe carries prohibited fruit.--When the American flying boat, the "Yankee Clipper," arrived at Baltimore on April 16 from Southampton, England, via Portugal, Azores, and Bermuda, inspectors Ranck and Vinzant intercepted four South African oranges and three oranges from the Azores in the ship's stores.

Banana leaves used as packing material.--A banana producer in Guatemala recently conceived the idea of removing the "hands" from 450 stems, packing them in banana leaves and then placing them in mahogany crates. As Fruit and Vegetable Quarantine No. 56 prohibits the use of leaves and plant litter for packing purposes, it was necessary upon arrival of the shipment at San Pedro, Calif., to require the removal of the objectionable material before releasing the fruit. The importer provided a crew of laborers who unwrapped and removed all of the leafy trash from each crate, placing each set of "hands" in separate boxes, after which the leaves and crates were collected and burned and the bananas released.

Correction.--On page 24 of the News Letter dated May 1, 1939, the host for the pyralidid Hellula phidilealis (Wlk.) should have been given as white chard, instead of Swiss chard.

Entomological interceptions of interest.--Two living immature specimens of the weevil Anthonomus rectirostris T. were intercepted at Washington, D. C., on January 13, 1938, in mazzard (Prunus avium) seed in the mail from Czechoslovakia. A. G. Boving reports that this species is doing noticeable damage to cherry trees in Europe, especially in middle and southern Europe. Specimens of the fruitfly Anastrepha fraterculus (Wied.) were intercepted at New York on July 18, 1938, in cherimoya (Annona cherimola) fruit in baggage from Peru. Five living larvae of the Mexican fruitfly (A. ludens Lw.) were intercepted at El Paso, Tex., on March 9 in a deseeded avocado in baggage from Mexico. The larvae were feeding in healthy tissue of the fruit. The scale insect Lepidosaphes hawaiiensis (Mask.) was taken at Miami, Fla., on February 17 on croton in baggage from Cuba. A living adult of the chrysomelid Plagiodera flosculosa Stal was intercepted at San Francisco on January 6 with orchids in express from Mexico. An adult of the weevil *Rhina scrutator* Oliv. arrived at Boston on December 6, 1938, on dried herbs in the mail from Montserrat. Living and dead larvae of the bean pod borer (*Maruca testulalis* Geyer) were found at New Orleans on January 23 in string bean pods in ship's stores from Brazil. Living specimens of the quahog-shaped scale (*Targionia quahogiformis* Merrill) were intercepted at Honolulu, T. H., on July 1, 1938, on *Dendrophylax funalis* in the mail from Jamaica. Adults of *Bruchidius alfierii* Pic. and *B. trifolii* Mots. were taken at Washington, D. C., on November 8, 1938, in *Trifolium alexandrinum* in the mail from Czechoslovakia. Living specimens of the scale insect *Parlatoria camelliae* Comst. arrived at Seattle, Wash., on December 15, 1938, on camellia foliage in cargo from Japan. Living specimens of the pyralidids were taken as follows in September 1938 in the field in Guam: *Nacoleia diemenalis* (Guen.) on *Desmodium gangeticum*, and *Sylepta derogata* (F.) on *Hibiscus tiliaceus*. Two living larvae of the pink bollworm (*Pectinophora gossypiella* Saund.) were intercepted at New York on January 20 in two cottonseeds in baggage from Haiti.

Pathological interceptions of interest.--The first interception of *Claviceps paspali* Stevens and Hall since 1926 was made on April 13 at New York in *Paspalum* seed from Costa Rica. A tomato from Mexico intercepted at Nogales on April 11 had what appeared to be "cloudy spot," the cause of which is unknown. *Gloeosporium* sp., with spores too long for *G. oncidii* Oud., was intercepted at San Francisco on March 31 on *Oncidium pulvinatum* in cargo from Brazil. *Glomerella cincta* (Ston.) Spauld. and v. Schrenk. was intercepted on March 23 at New York on the leaves of a dracaena from Italy. *Gymnosporangium japonicum* Syd. was intercepted at Seattle on April 8, on a juniper in baggage from Japan. *Heterodera marioni* (Cornu) Goodey was intercepted on special permit violet plants in mail from Japan on February 24, at Seattle. *Peronospora pisi* (De B.) Syd. was found in green peas from Italy on April 24 at New York. *Phomopsis mali* J. W. Roberts was found on apples from Japan on February 24, at Seattle. *Pleospora ephedrae* Speg. was intercepted on *Ephedra sinica* in mail from Japan on March 27, at New York. *Pratylenchus pratensis* (de Man) Filipjev, but varying from the type, was found in yams in baggage from St. Vincent, B. W. I., March 27, at Boston. *Rhytisma erythrosporum* Berk. and Curt. was found on oak leaves accompanying cargo from Mexico on March 27 at Galveston. *Scirrhia rimosa* (Alb. & Schw.) Fckl. was intercepted on *Phragmites communis* in mail from Belgium on February 15 at New York. *Septoria hepaticae* Desm. was intercepted at New York on April 27 on *Hepatica triloba* leaves on a clump in baggage from Norway. *Sorosporium reilianum* (Kuehn) McAlp. was intercepted in broomcorn on March 27 at Boston in cargo from Hungary.

DOMESTIC PLANT QUARANTINES

Grasshopper developments.--Hatching of economic species of grasshoppers had begun in the week ended April 22 in Arizona, California, Texas, New Mexico, and Oklahoma. A severe outbreak of *Melanoplus devastator* Scudd. was reported in the San Joaquin Valley of California and heavy baiting operations were begun that week. Reports of threatening, severe infestations were also received from the Yuma Valley area of Arizona. A week later two of the most important economic species, the two-striped grasshoppers and the migratory *Melanoplus mexicanus* Sauss. were hatching in Wyoming and western South Dakota and also the big differential hopper in northern Texas and southern Oklahoma. By the first week in May the economic species were reported to be hatching in every infested State except a few in the Mississippi Valley north of Arkansas. The migratory range species in the southern part of the infested area in New Mexico had a population ranging up to 1,500 per square yard, while the migratory species of the northern Great Plains was hatching in western North Dakota and eastern Montana. Results of surveys this spring indicate that the extent of parasitization and predatorization remains practically the same as that reported last fall. Reduction in numbers of egg pods by natural factors during the winter has been negligible.

Grasshopper baiting and baiting materials.--Shipments of bait materials were made the week ended April 22 to counties in California, Colorado, Idaho, Nevada, Montana, North Dakota, Oklahoma, South Dakota, New Mexico, and Texas. Many local transfers of bait material were arranged within the States between counties having a surplus and those in need of materials. It is expected that the entire needs of several States will be met in these transfers. Approximately 50 percent of the estimated needs were on hand by May 1 in the infested States, or had been shipped. Sufficient bran to mix several thousand bait-tons has also been placed in strategically located storage plants. Large-scale baiting operations were begun in New Mexico, California, Arizona, and Nevada the first week in May and mixing operations were under way in parts of Montana and South Dakota.

Cooperation in grasshopper baiting.--Excellent cooperation in furnishing assistance in hauling grasshopper bait and bait materials, in the construction of mechanical bait spreaders and bait mixers, in the promotion of educational and organizational work, and in other phases of grasshopper control work has been rendered by the Extension Service in the various States and by the Soil Conservation Service, the Civilian Conservation Corps, and other Federal agencies, as well as by the State highway departments of several States, and local commercial groups and organizations. The setting up and operation of bait-mixing stations in many States by the Works Progress Administration and the Farm Security Administration is valuable assistance. The State of New Mexico has appropriated $70,000 for supplying the necessary sawdust in that State this season. About $2,500 has been raised locally by two New Mexico counties. Benefit dances are held in some places, the proceeds to be used for grasshopper control.

Technical service unit on grasshopper control project.--Three supervisors are working under the direction of R. L. Shotwell obtaining detailed, scientific information as to grasshopper egg development, parasitization, predatorization, and probable time of hatch of the various infestations, and devising a practical adaptation of present survey methods for use on range lands.

Mormon cricket control in progress.--Mormon cricket control operations were under way in April in Oregon, Washington, Idaho, Nevada, and Utah, and to a limited extent in Wyoming. Cold and windy weather in Montana, Nebraska, South Dakota, and Wyoming retarded the cricket hatch in most areas of these States and necessitated delay in dusting. A machine for mixing poison dust is being constructed at Billings, Mont., in order to supply that State with mixed dust for the work this season. Control operations in April were devoted for the most part to dusting of crickets on the egg beds and in crop lands or areas adjacent thereto. Power dusting was stressed in areas where this type of machine is practicable and this work was supplemented with hand dusting and with barriers of metal, of oil-on-water, and of trenches. Control was uniformly successful, the percentage of kill estimated at from 80 to 100 percent. In many areas cricket bands were eradicated or greatly decreased before crop lands were entered. Only limited damage to crops was reported. Some 80,000 pounds of mixed dust was used on nearly 17,000 acres of crop and range land, of which over half was covered by power dusting and the remainder by hand.

Surveys of Mormon cricket damage continued.--The survey which was conducted in 1938 to determine Mormon cricket damage to cultivated crops and range plants is being continued this year on a much wider area of vegetation types. Samples of representative damage are being taken in the several infested States, particularly those having the greatest concentration of crickets. New plots to study recovery of severely injured plant species are being established, and sampling based on the point-observation-plot method of range survey is being undertaken. In addition to such work, which is conducted by two specialists, all supervisors are reporting their observations in the various counties and providing photos of damage.

Phony peach and peach mosaic control work.--Inspection and tree-removal work was carried on in April jointly with the States, and under allotments from emergency funds, in Alabama, Arizona, Arkansas, California, Colorado, Georgia, Mississippi, South Carolina, Tennessee, Texas, and Utah. Over 1,500,000 abandoned, escaped, or diseased trees were destroyed.

Peach mosaic found in two more counties.--Early in April two peach seedlings infected with the mosaic disease were found in the northern part of Imperial County, Calif., near Calipatria. The disease has not previously been found in this county. Peaches are not grown extensively in Imperial County and there are no nurseries growing peach stock in the Imperial Valley. Mosaic infection was also found in Jones County, Tex., for the first time. On a commercial property having 112 peach trees, 110 were heavily infected.

Other findings of peach mosaic.--A considerable increase in number of mosaic infected properties at San Bernardino, Calif., is reported, involving, however, only 1 or 2 diseased trees to the property in most cases. Tree-removal work was carried on in April in Riverside, San Bernardino, Los Angeles, and Imperial Counties with 151 relief laborers. They effected the destruction of 5,500 abandoned peach trees and 456 diseased trees. In the Palisade area of Mesa County, Colo., inspection conducted on the more heavily infected properties resulted in finding 1,551 mosaic trees the first week. A force of 36 Bureau, State, county, and emergency-relief inspectors worked the area that week. Growers have cooperated 100 percent with the work in that area. In the Dixie area of Utah the first inspection showed an increase of about 500 percent in infected trees, as compared with the numbers found in the 1938 season. All diseased trees were removed. Nursery and budwood environs inspections in Texas, conducted by 15 Federal and State inspectors in 2-man crews, have completed work in the area regulated under the State quarantine, with the exception of 1 county. Peach mosaic was found in 7 counties where the disease was known to exist last year, including Smith County, a large nursery producing county. Over 1,000 diseased trees were found in the El Paso area and the work is not complete. Tree-removal work in Texas is now concentrated in Smith and Brown Counties, with a labor force of 60 men.

White-fringed beetle inspection and control.--Larval inspection in the area infested with white-fringed beetles at Mobile, Ala., in April resulted in finding no larvae, giving a favorable indication of the efficacy of last year's control measures. Inspection at Monroeville, Ala., in woodland adjoining an infestation resulted in finding no larvae beyond a short distance in the woods. One new infestation was found at Baton Rouge, La., and one at Florala, Ala. Larval injury to cultivated crops was found at Florala, Beatrice, and Repton, Ala., and severe damage to fields in Carriere and Saucier, Miss. At Long Beach, Miss., in a field containing 122 hills of cantaloups, all but 25 were killed by white-fringed beetle larvae. Cleanup operations were conducted in Mobile and Florala during the month. Spray machines and the dusting machine have been improved by the construction of devices that increase the output.

Regulatory work in white-fringed beetle area.--Movement of Irish potatoes has increased greatly, necessitating inspection at the New Orleans markets from 2 a.m. till 10 p.m. Over 1,200 permits were issued for potatoes and over 2,000 permits for movement of nursery stock with soil, all from the New Orleans area. Nearly 10,000 plants in that area were fumigated with methyl bromide. Soil sterilization operations at 2 nurseries have been completed with 81,500 square feet of soil having been sterilized for plunging beds. A number of violations of the quarantine consisting, for the most part, of plants with soil transported by various individuals, were intercepted. At Saucier, 2 carloads of rosin, of which large quantities are shipped to England, were inspected, to insure that no soil was being transported therewith.

Quarantine circular issued to nurserymen in white-fringed beetle areas.--Suggestions as to types of plunging beds or growing beds which may be constructed, and which, together with the use of barriers and other protective measures should be effective in preventing natural infestation by the white-fringed beetle, have been provided to nurserymen through circular B. E. P. Q. 496, dated April 28.

White-fringed beetle certification requirements suspended as to additional area.--Under a revision of circular B. E. P. Q. 485, which became effective May 8, three Louisiana parishes were added to the area from which certification requirements under the white-fringed beetle quarantine were suspended until July 1, as to restricted articles free from soil. These parishes are Jefferson, Plaquemines, and Orleans, including the city of New Orleans.

Sweetpotato weevils diminishing.--Recent results of trapping sweetpotato weevils in Baldwin and Mobile Counties, Ala., indicate there has been a decided decrease in the adult weevil population in that State in the last year. This practice of placing occasional sweetpotato tubers into cleaned fields and later removing them with the feeding weevils has been found effective in indicating the trend of the population. Alabama-sponsored W. P. A. crews continued, in March, to clean infested properties and those adjacent by plowing and removing host material. Inspections of plant beds, of storage places, and of wild host plants in the infested areas were conducted in that State. In Georgia control activities were carried on in 11 counties and eradication measures in Thomas County. Host material brought into Georgia and Mississippi for planting purposes, without compliance with the sweetpotato weevil quarantines of these States, was promptly confiscated by State inspectors. Work in Texas during the month consisted of eradication, control, and surveys in several counties. Throughout the month 18 infestations were reported, all from Alabama.

Citrus canker eradication.--The Bureau continued inspection work in Louisiana jointly with the State until April 15, when 2 of the Federal men were transferred to another project and 2 returned to inspection in Texas. In the period since the first of the year, inspections in Louisiana were made on 4,600 properties in 14 counties, including a number of properties infected in former years, and of the area surrounding them. The only finding of citrus canker was on a property in Terrebonne Parish reported by State inspectors on January 11. In Texas 2 crews of 2 men each inspected Galveston and Texas City and 7 men conducted inspection and supervised labor crews "strip working" areas where Citrus trifoliata had been found in Brazoria, Galveston, and Harris Counties, including wooded areas where seedlings of this species are sought out and destroyed. In these inspections 7 formerly infected properties yielded no canker. In Galveston 3 weeks' work by 2 to 4 inspectors accomplished the inspection of 849 properties having 1,698 dooryard citrus trees, only 11 of which were Citrus trifoliata.

Transit-inspection work.--Transit inspection is now carried on the year round at 13 stations, with seasonal coverage in nursery stock shipping seasons at 4 other points. There is at present a force of 34 inspectors, of which 16 are employed by this Division and 18 by cooperating State agencies or by quarantine projects of other divisions of the Bureau. In April 377 violations were intercepted, including 2 infringements of the white-fringed beetle quarantine, 1 of which was intercepted at Saint Louis and 1 at Cincinnati.

Carriers cooperate in transit inspection.--Through the assistance of Railway Express Agency employees, the transit-inspection office in Chicago was recently provided with a count of the number of plant shipments that arrived by express in that city over an 8-day period. There were 23,539 such shipments reported as unloaded at the 9 stations. Details were provided as to train numbers and time of arrival and number of shipments. These figures are of great assistance in working up tours of inspection. Similar information from freight houses and trucking companies has also proved useful.

Interceptions of interest.--From Pittsburgh comes the report of the interception of a number of dahlia tubers for lack of Japanese beetle certificates. Dahlia tubers, other than single tubers, were brought within the regulations of this quarantine in the revision which became effective on February 20. Some of these dahlia shipments were also violations of State quarantines relating to the European corn borer. A New York inspector reports the interception of a shipment to Alaska of uncertified maple cuttings from the gypsy moth area. A Boston inspector found a shipment labeled, "Glass-Handle with Care," and waybilled as glass, which contained a shrub in soil.

CONTROL INVESTIGATIONS

Specificity of insecticides.--In biologically evaluating household insecticides it has been the custom to use the housefly (Musca domestica L.) as the test insect. Resultant toxicity values are assumed to be valid against the roach, bedbug, and like insects, even though it is well known that some insecticides possessing high toxicity to certain groups of insects are worthless against others. With this in mind, two different household insecticides were tested by W. N. Sullivan and others at the Beltsville, Md., laboratory of this Division in a preliminary manner against the American cockroach (Periplaneta americana (L.)) by the turntable method, using concentrations adjusted to give similar kills against the housefly. The results of these tests to date indicated that, though insecticide A and insecticide B were equally effective against the housefly, insecticide B was much superior against the roach. As it is the control of the roach or bedbug that is of primary importance to many establishments buying large quantities of insecticides on the basis of their biological evaluation, it would appear that this rating should be on a broader basis than is now in use.

INSECTICIDE INVESTIGATIONS

Progress in the chemistry of pyrethrum flowers.--In the May 1939 issue of Pests (v. 7, No. 5, pp. 9, 10), H. L. Haller and F. B. LaForge, of this Division, outlined a new method for the determination of pyrethrin I and pyrethrin II in pyrethrum flowers. Upon hydrogenation these constituents are split with the formation of acids which are separated by steam distillation and determined by titration. A number of practical details remain to be worked out, but the method looks very promising.

Effect of temperature and light on the decomposition of derris.--A study of this subject has just been published by R. D. Chisholm, of the Moorestown, N. J., laboratory (Soap, v. 15, No. 5, pp. 103, 105. May 1939). He found that derris deposits were decomposed, both in the presence and in the absence of sunlight. The rate of decomposition was increased when the temperature was increased. After exposure for 15 days to sunlight at 32.5° F., an average of 60 percent of the deposit was decomposed, whereas 73 percent was decomposed at 70-75°, even though the latter deposits were subject to the screening effect of greenhouse glass. In the absence of light and at similar temperatures there was no measurable change; however, when the temperature was increased to 120° about one-fourth of the deposit was decomposed.

N-nitrosodiphenylamine.--A patent covering the use of this compound as an insecticide was issued on April 18, 1939, to A. F. Freeman, formerly of this Division. This patent, U. S. 2,155,010, reports that N-nitrosodiphenylamine is as effective as lead arsenate used on the imported cabbage worm and also on the cross-striped cabbage worm, and that on the southern army worm it is more effective than barium fluosilicate.

BEE CULTURE

House-cleaning behavior of honeybee important factor in resistance to American foulbrood.--A variation in the time required by different colonies to remove larval remains infested with foulbrood from the hive was reported in a recent number of the News Letter (v. 6, No. 3, pp. 25-26. March 1, 1939). It has now been observed that degree of resistance to this disease is not entirely correlated with the rapidity with which the disease remains are cleaned out. A. P. Sturtevant, in charge of the American foulbrood resistance studies at Laramie, Wyo., reports: "It has been observed that in a large number of cases, healthy brood has been reared in cells from which diseased remains have been cleaned out, the house-cleaning having been done so effectively that brood reared in such cells becomes infected from being given infected food rather than from diseased material remaining in the cells. Continued studies of the behavior of different strains of bees toward brood infected with American foulbrood have further indicated, however, that there is a considerable variation in the rapidity of removal of diseased remains between colonies of different strains and even between colonies with sister queens, not entirely correlated with past history of strain resistance. Furthermore, preliminary tests made with eggs from queens of various strains placed in brood nests of heavily diseased colonies failed to show significant differences in physiological resistance between the brood of susceptible- and that of resistant-strain colonies. These observations indicate that the house-cleaning activity behavior character probably plays an important part in so-called disease resistance."

IDENTIFICATION AND CLASSIFICATION OF INSECTS

Hypera postica (Gyll.) and H. brunneipennis (Boh.).--The alfalfa weevil (*H. postica*) and the Egyptian species (*H. brunneipennis*), recently discovered in Arizona, are very closely related and absolute characters for distinguishing individual specimens in the adult stage have not been observed in the preliminary study of rather limited material made thus far. However, the following average differences are rather distinct when series are available for examination: In length *H. postica* ranges approximately from 4 to 5.5 mm. and *H. brunneipennis* 4.5 to 6 mm., a series of the latter averaging 0.5 mm. longer than *postica*. The elytral length is to the pronotal length about as 14 is to 5 in *postica* and about as 16 is to 5 in *brunneipennis*: this, in conjunction with the greater body length of *brunneipennis*, gives this species a more slender appearance than in the average *postica*. In some males of *postica* the sides of elytra are more or less convergent posteriorly throughout most of their length, whereas the males of *brunneipennis* have the sides of the elytra subparallel. From one-third to one-half of the *postica* specimens examined have the dark scutellar patch evident, or at least the suture and base of interval 3 dark; in *brunneipennis* almost uniformly pale brownish specimens are fairly common, others are brownish with small fuscous spots or tessellations, and still others have a dark scutellar patch which, however, is never as sharply defined as in some specimens of *postica*. The dorsal setae are somewhat finer, more abundant, and less appressed in *brunneipennis*, often forming a crowded, double row on some parts of some of the elytral intervals; the less appressed nature of the setae in *brunneipennis* is usually apparent on the elytral humeri and on the lateral margins of the prothorax. Finally, the scales seem to be a little smaller and relatively broader in *brunneipennis*. As yet no differences have been found, on examination of a very small quantity of material, to separate the two species when in the larval stage. However, the few cocoons that have been available are apparently distinguishable, even with a hand lens. Those of *brunneipennis* are of finer mesh, the interstices between the fibers being smaller than those of *postica*. Only a comparatively small number of cocoons have been examined, however.

Abnormality in a larva of the white-fringed beetle.--A prothetelic larva, identified by W. H. Anderson as almost certainly *Naupactus leucoloma* Boh., was collected in New Orleans by E. M. Livingston and submitted recently for determination. In common with prothetelic larvae in general, paired wing pads are present on mesothorax and metathorax. In addition, however, there are three pairs of well developed, although pupiform, legs, which, of course, are absent in normal weevil larvae. It would seem that the definition of prothetely should be extended to include a condition such as exhibited by this specimen.

A Japanese aphid on shallot onions in Virginia.--Specimens of aphids on shallot onions received from Lauren D. Anderson, of the Virginia Truck Experiment Station, have been determined by P. W. Mason as *Micromyzus formosanus* Takah.). This species was redescribed by Essig in 1935 as *Micromyzus* alliumcepa from onions, chives, and leeks in California. There appear to be no other records from the United States. In Japan and Formosa, Takahashi has recorded it from *Allium fistulosum*, *Allium scorodoprasum* var. *viviparum*, *Lilium fistulosum*, and *Lycoris sanguinea*. Mr. Anderson states: "These aphids are very abundant and are doing considerable damage."

Interesting scale insect on bamboo described.--A very peculiar bamboo coccid of uncertain relationships, which has stood unnamed in the Bureau coccid collections since its receipt in 1916 from Harry B. Weiss, who obtained it at Riverton, N. J., on *Bambusa metake* from Japan, has just been described from that country as *Idiococcus bambusae* Takahashi and Kanda (Ins. Matsumur. 18 (1939), p. 52). Presumably it has not established itself in this country, as no collections other than the original one have ever been received.

Some recent additions to the reference collections.--A collection of Australian leafhoppers, consisting of 63 specimens representing 39 species, has recently been received from J. W. Evans of Hobart, Tasmania. Most of the species were not heretofore represented in the collections of the National Museum, and consequently add considerably to the value of our collections from that region. It is believed that the material will be especially helpful in generic studies now in progress. A small but valuable collection of weevils from Brazil has been presented by Edson J. Hambleton. This comprises 16 species, including several species of the genus *Naupactus* and other relatives of the white-fringed beetle. There have also been received 15 Schmitt boxes of cactus insects from Leith F. Hitchcock, of the Australia Prickly Pear Board. This material, containing some interesting and valuable items, was forwarded for incorporation in the National Collection.

---oOo---

UNIVERSITY OF FLORIDA
3 1262 09244 4917